

Management of Projects Seminar



June 8-9, 1998, Stockholm, Sweden

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EVM - The UK MoD Perspective

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Defence Procurement Statistics

- PE employs approximately 5400 staff.
- ~£B6.5 per year spent on new equipment.
- ~£B2.5 per year on spares and maintenance.
- ~275,000 jobs in British industry are directly or indirectly supported by this expenditure.
- ~70,000 contracts placed per year.
- ~10,000 firms are working on defence business.

Source: UK Defence Statistics 1997

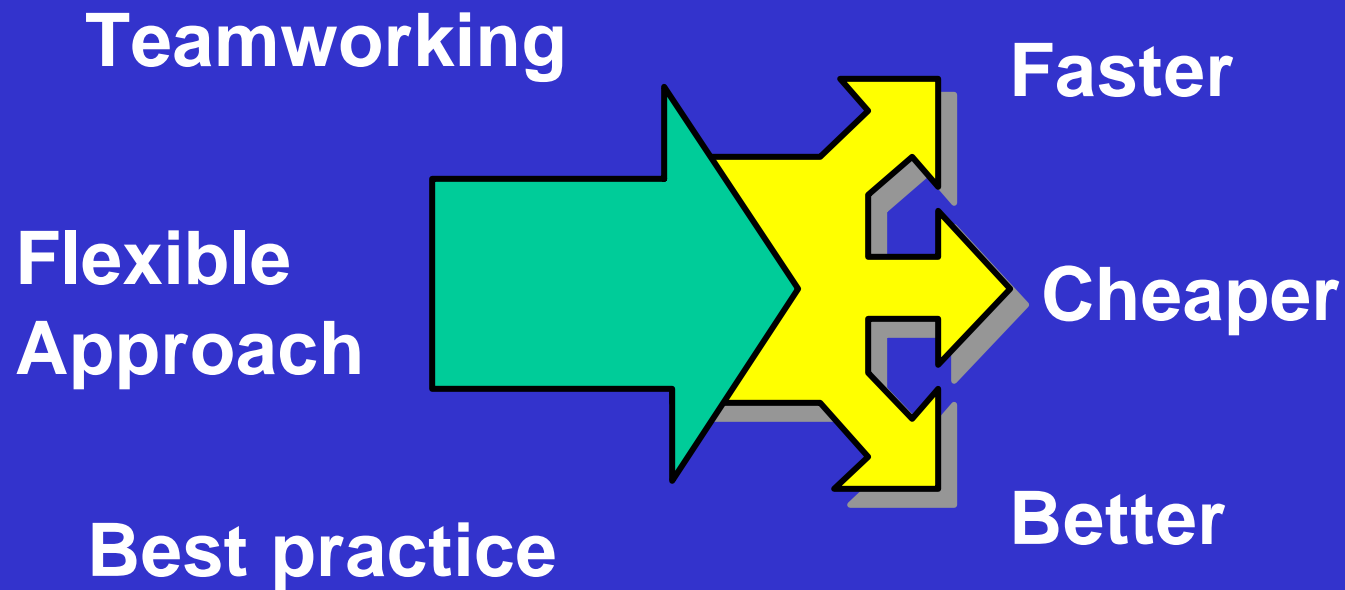
Defence Procurement Characteristics

- High value - low volume (Top 25 projects account for approx £B35).
- Complex systems using leading-edge technology.
- Must provide competitive advantage in the battlefield, zero risk is not an option.
- Public accountability, risk adverse.
- VFM - competitive national defence industry.
- International collaboration.
- Defence market is small part of total market for new technology.

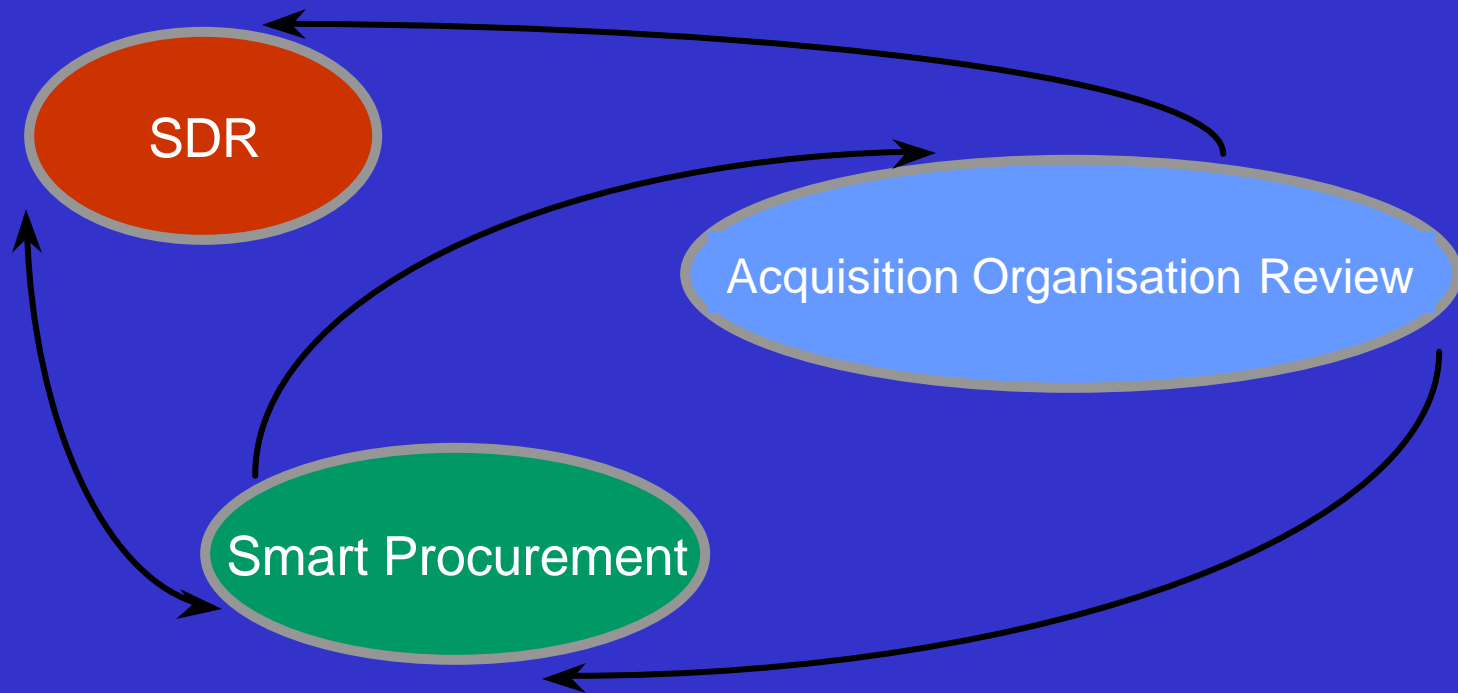
Drivers for Change

- In July 1997 Secretary of State announced that the SDR would include a “Smart Procurement initiative...”
- Need to eliminate cost overrun and slippage.
- Defence resources decreased in recent years.
- Military tasks are less predictable.
- Technology evolving quickly.
- Changing Industrial scene.

Smart Procurement: What is it?



Smart Procurement & The Acquisition Organisation Review



- SP Assumes existing organisations and reviews processes
- AOR Matches organisational structures to procurement processes (more radical pan-MOD acquisition process)

Smart Procurement: Key Themes

- Systems Engineering (Through-life).
- Integrated Stakeholder Project Teams.
- Incremental Acquisition
& Concurrent Engineering.
- Rapid Pull-Through of Technology.

Single Team

- Bringing together requirements, technical, procurement, contracts, finance and logistics staff into one team.
- Under the clear leadership of a team leader able to balance trade-offs between performance, time and cost within boundaries set by approving authority.
- Includes industry(prime and major sub-contractors), except during competitions, and remains intact during life of project.

Single Customer

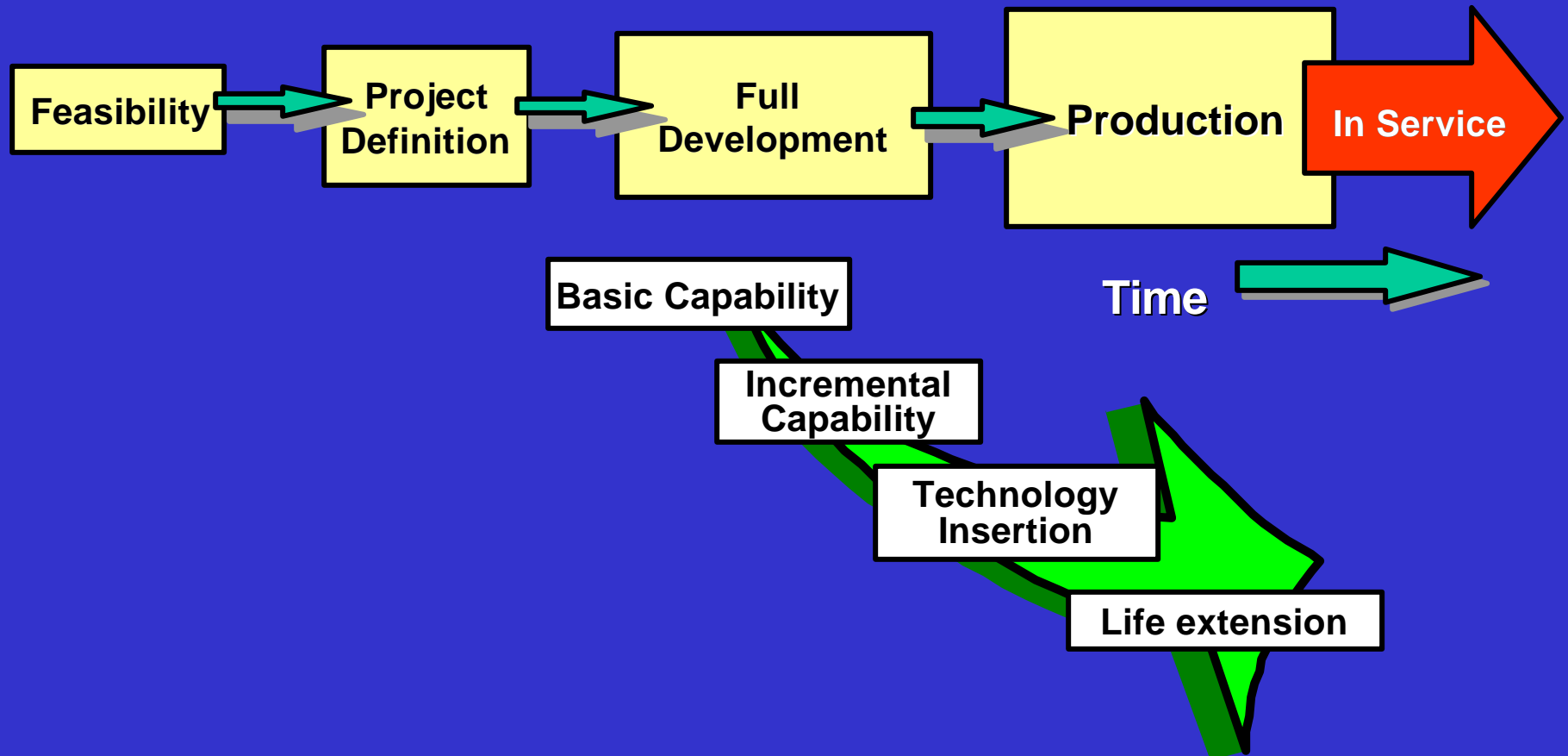
- Identification of a clear customer within MoD for the final output of the project team. Customer likely to be MoD Centre until acceptance and Single Service subsequently.

Flexible Practices

A segmented approach to acquisition :

- Tier I - OTS items, low tech risk and UPC, eg vehicles and commodity items.
- Tier II - Defence specific items, MoD needs to be intelligent customer, eg. sub-systems, stand-alone weapons or equipment upgrades.
- Tier III - Most complex weapons and platforms, which require the integration of Tier I & II equipment and interaction with others, high UPC and substantial technical risk.

The Outcome?



UK MoD - EVM Current Status

- Exposure to EVM reports on Replacement Maritime Patrol Aircraft, Joint Strike Fighter and some aero-engine Technology Demonstrator Programmes (TDPs).
- No formal MOD contractual conditions for the provision of EV data or reporting.
- Although mentioned in MoD(PE) policy and guidance there is little general awareness within MoD Projects.

Smart Procurement and EVM - A Culture Change

- Smart Procurement(SP)/AOR will radically change the way the MoD does business.
- EVM is consistent with the thrust of SP/AOR and will complement both.
- MoD recognises that EVM provides not only an effective management discipline at the working level but also a powerful means of communication throughout the project.
- Combination of planning, integrated cost, schedule and technical performance measurement will yield a greater visibility of actual performance against programme than is currently available.

MOD(PE) Policy on EVM

- Although EVM will not be mandated, the inclusion of EVM in bids will be recognised as a step forward towards improved Risk Management.
- Acknowledges EVM as “Best Practice” and fully supports its adoption in Defence Procurement.
- MoD(PE) staff to be educated about EVM.
- EVM to be considered for internal MoD(PE) applications.
- MoD(PE) wishes to become a full participating member of the IPMC.

EVM in the UK - Recent Events

- **6th May 98 - CDP gave his 'strong support' to EVM as 'best practice' for defence procurement. UK to join IPMC as a full participating member.**
- **19th May 98 - Members of the IPMC briefed UK EVM Industry User Group. EVM Guidelines to be produced.**
- **20th May 98 - EVM Conference in London.**
- **21st May 98 - Briefing to MOD(PE) Senior Staff by IPMC Members.**
- **June 98 - Core Briefing/Publicity for all MOD(PE) Staff.**

Way Forward

- To encourage UK Industry to embrace EVM as “Best Practice” to the benefit of both MoD and Contractor.
- To fully participate as a full member of the IPMC and learn from other nations'/organisations' experiences.
- To participate in UK Industry EVM User Groups to further understand how the implementation of EVM will assist both MoD and Contractor.
- Application of EVM to Fixed Price Contracts?

Summary

- Smart Procurement is the way ahead for Defence Procurement.
- There are a number of key enablers.
- EVM can provide the discipline for rigorous programme management.

A light gray world map serves as the background. Two yellow stars with black outlines are positioned on the map: one in the western United States and another in Stockholm, Sweden. A black curved line connects the two stars, arching over the Atlantic Ocean.

USA EVM Update

**Project Performance Management
Conference, Stockholm**

Mr. Gary Christle

Background: Cooperation

- ◆ **Mid-1980s**
 - Australia
 - Canada
- ◆ **1992 Trilateral Defense Cooperation Forum**
- ◆ **1993 International Performance Mgmt Council**
 - United States
 - Australia
 - Canada
 - Sweden

International Objectives

- ◆ **Use Defense resources wisely**
- ◆ **Cooperate with industry**
- ◆ **Activities-**
 - **Exchange information on policies & procedures**
 - **Mutual recognition of contractors**
 - **Advocate improved project management**
 - **Outreach to industry, academia, professional associations**

EVM in the Past Year

- ◆ **US General Accounting Office report**
 - “Significant Changes Underway in DoD ...”
- ◆ **Office of Management and Budget guidance**
 - Capital Programming Guide
 - EVM required for all government agencies
- ◆ **American National Standards Institute**
 - “Earned Value Management Systems” standard
 - With BS 6079, one of two *industry* standards

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EVM in the Past Year

- ◆ **EVM satellite broadcasts**
 - Acquisition Reform
 - Software Program Managers Network
- ◆ **Earned Value Management Center**
 - Defense Contract Management Command
 - Los Angeles, California
- ◆ **Military Handbook 881 “Work Breakdown Structures”**

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EVM in the Past Year

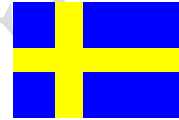
◆ Government activities

- Naval Air Systems Command**
- Marine Corps and Army depots**
- Air Force Arnold Engineering & Development Center**
- Test ranges**

◆ David Packard Award

- “implemented a shift in ownership and responsibility from government to industry and created a recognized international best practice”**

The Way Ahead



◆ Encourage industry ownership

- ANSI/EIA-748 + BS 6079 = ???

◆ International cooperation

- International Performance Management Council
- Professional associations
- Other countries

◆ Objective

- Internationally accepted guiding principles for project management in government and industry



The Power of Insight

Remarks by
Daniel P. Czelusniak
Director, Acquisition Program Integration
Office of the Under Secretary of Defense (Acquisition & Technology)

National Defence College
Stockholm, Sweden
June 8, 1998

Introduction

Good morning. I am pleased to be with you at this second Earned Value Management conference to be hosted in Stockholm. Not many years ago, the only place one could go to an earned value forum was the United States. But today, this powerful management technique is accepted in many countries.

Last September, I joined delegates from Sweden and other countries at a joint government and industry conference in Australia. And last month in the United Kingdom, defense representatives from four nations (Australia, Canada, Sweden, USA) gathered to welcome contractor and government representatives from the UK to the growing colloquium of earned value management. The events included a meeting with industry earned value practitioners in Oxford, a public conference in London, and a meeting with the Ministry of Defence in Bristol.

I would like to take this opportunity to congratulate my colleagues from the UK on their very successful "Earned Value Week" and to welcome them to an international community committed to fostering integrated program management. The open discussions were very much in the spirit of cooperation that is the hallmark of the International Performance Management Council. There now are six nations in the Council: Australia, Canada, New Zealand, Sweden, the United Kingdom, and the United States. I am certain that number will continue to grow as the defense organizations of other friendly governments learn about our mutual accomplishments.

The Defense Management Environment

Today, from a defense strategy standpoint, our management challenges, especially the task of managing risk, have become perhaps more complicated than ever before. While the threat of global war has greatly diminished, at least in the near term, the world remains a tumultuous and, in many ways, a more unpredictable place. Instability in Southwest and Northeast Asia, nationalism and ethnic tensions in Europe, and the recent, dramatic events in India and Pakistan, pose risks that are difficult to define, much less manage. The proliferation of weapons of mass destruction threatens our interests, our forces, and even our homelands. And

threats from terrorism, international organized crime, and drug trafficking still plague us.

Politically, economically, and technologically, the world is changing at an unprecedented and sometimes unsettling rate. Our national destinies are being bound ever more closely to foreign interests by the technological “shrinking” of time and distance. While this may work to our advantage as we seek to promote free markets and the principles of democracy, it increases the degree to which we all are affected by external developments and risks.

We do not have the choice of insulating ourselves from the forces sweeping the globe. We have to be able to effectively manage the associated risks. The geopolitical landscape of the 21st century will increasingly demand that we act in concert with others to deal with challenges.

So in a sense, our challenges on a macro level of world affairs and national defense are not too fundamentally different from the challenges we face on a micro level of program management ... and I believe the challenges we face in United States’ defense program management are not fundamentally different from the challenges faced by other countries. Certainly we all face the familiar problem of complex systems integration, whether our final product is a weapon system or any other capital asset. Whatever the differences among our products, there should be no differences in the basic management principles applied to acquisition of those products.

And that brings me to the reason we are here ... to discuss the principles of earned value management...principles which can provide us with the “The Power of Insight.” I would like to use my time this morning to first explain what I mean by management insight and then to discuss how it is improving defense program management and supporting our new “revolution in business affairs.”

I should preface my remarks by saying that the same principles we follow for large defense programs indeed are being used equally effectively on smaller programs, on work that we perform in our internal defense facilities, and on commercial work that has nothing to do with defense. You will hear more about that from other speakers during this conference.

The Way it Was: Oversight

Before we embraced the idea of *insight*, the Department of Defense relied on a traditional *oversight* management model. Our defense organization has many levels, and relations between them can be difficult—between contractors and program management offices, between program management offices and higher military department headquarters, and between military departments and the Office of the Secretary of Defense. This hierarchical structure made people think in terms

of “us” vs. “them” because actions at any level were subject to review and change by higher authorities. Unfortunately, it also contributed to serious cost and schedule difficulties on defense programs.

At the beginning of the 1990s, each of our military departments had at least one major program management disaster that made front-page news. Such problems caused our political leaders to lose confidence in our ability to manage, and threatened the very existence of some defense companies. This troubled those of us in the acquisition management business, because we knew we had tools that could identify and prevent such unpleasant surprises.

Earned value management was one of the tools, and it had been in our tool kit since the 1960s. By using earned value information in the Pentagon for program oversight, we showed again and again that we could predict program cost, schedule and technical problems far in advance. But that same information was not being used effectively by contractors, by program management offices, or by the military departments.

Part of the answer to the management problem lies in the organizational structure itself. Traditional oversight can be seen as creating barriers to good management. Trust is essential for open communication, but trust is hard to achieve when organizations have a history of “us” vs. “them.”

So we embarked on a focused effort to overcome the barriers, to build bridges of mutual trust and open communication. Working with both industry and our program managers, we began to understand the reasons why they often failed to recognize program cost and schedule problems while there was still time to correct them. What we found, in retrospect, was not very surprising.

Simply put, earned value management was seen by industry and government managers as a financial reporting requirement rather than as a management enabler. The process we used to review our contractors relied on excessive checklists and paperwork, difficult terminology, and overly complicated procedures. By openly discussing these issues, we focused attention on the problems rather than on the people.

We also recognized that tools and techniques cannot manage programs or control anything ... only people can do that—the right people. If you give a program manager a tool that is identified with cost accounting, its use will be assigned to a cost accountant. If you give a program manager a tool that’s identified with cost reporting, its use will be assigned to a cost analyst. We used both of those approaches under our old Cost/Schedule Control Systems Criteria (C/SCSC). Neither fostered teamwork or effective management. It was clear we needed to reinvent our management process and to give our program managers a tool they would accept as a valuable enabling device.

The objectives we announced in 1993 to improve earned value management were simple:

- Keep the good principles and eliminate the bad practices
- Equate earned value with sound program management
- Shift responsibility (or “ownership”) from government to industry

But cultural change does not happen quickly—and make no mistake, this is a very different way of doing business. Following a thorough review of earned value requirements, the Under Secretary of Defense, in 1995, had this to say about earned value:

The term “earned value management process” means to me ... that whenever the Department puts public funds at risk ... a process exists to manage those resources wisely. Let me repeat ... I expect public funds to be managed wisely. The key word is “managed.” Not “accounted for,” “monitored,” or “reported,” but managed.

From Oversight to Insight

The earned value reform objectives supported the larger acquisition reform objectives introduced by the Department of Defense at about the same time. In fact, earned value is one of our most effective ways to make acquisition reform work for complex programs. Let me explain what I mean.

One of the main ideas of acquisition reform is to replace *oversight* with *insight*. The organizational change that makes insight possible is the Integrated Product Team. If you were to ask me what the single, most valuable acquisition reform initiative has been to date, I would answer without hesitation ... the introduction of integrated product teams, and the integrated product and process development concept. Both are now in wide use throughout our defense programs. They have been embraced readily because they produce instant benefits through the power of teamwork and delegation of authority.

The IPPD concept integrates all acquisition activities starting with requirements definition and continuing through development, production, deployment and operational support in order to optimize the design, manufacturing, business and support processes. At the core of IPPD implementation are integrated product teams, which bring together representatives from various disciplines at the very start of the program. Teams represent all the organizations involved in the program, including the contractor as soon as prudent business practice allows.

This helps manage risk by allowing for early and continuous insight by all the stakeholders. It also encourages team members to work together in an atmosphere of trust and cooperation, and allows informed decision making to take place at appropriate levels. The improved communication between customer and supplier, and the many functional disciplines involved in a program, enhances risk management as a natural outcome of eliminating barriers to knowledge. By having knowledgeable people work toward common objectives as a team, we enhance our ability to fully integrate risk identification, analysis and mitigation measures in all areas.

An essential part of earned value application is the Integrated Baseline Review. Working together soon after contract award (or even earlier in a noncompetitive situation), the government and contractor team discuss plans to execute the contract in terms of work scope, schedules and resources. This is referred to as a performance measurement baseline. The goal is mutual understanding, and identification of risk is a critical element. Once the integrated plan, including the performance measurement baseline, is in place, its execution is managed using the contractor's earned value management method.

Reliable information is an essential requirement for effective team management. And earned value information, as we know, is indeed reliable. When earned value is used properly to integrate the team's plans to meet cost, schedule and technical performance objectives, it becomes an extremely powerful insight tool.

When oversight changes to insight, the nature of reporting also changes. Oversight depends on reports, with their content defined either by the customer or by higher management levels. But with integrated product teams, reporting becomes a by-product of the management process. The team decides how much information is necessary, at what level, and how frequently. When earned value is used for management, the reporting burden drops greatly because teams that use earned value on a regular basis find little reason to write detailed after-the-fact reports. Electronic access to data eases the reporting burden even more.

Earned value information flows up as needed to inform management about work progress on assigned products, organizations, or activities. And at the highest management levels, summarized information facilitates comparisons between and among programs. In this way, the former reporting, oversight tool is transformed into a powerful enterprise-wide communications tool.

Such power brings with it a danger, if information is used to punish rather than to inform. As we move from our old ways of doing business, we find that trust and openness constantly must be encouraged to avoid that danger. And we have enough experience now to know that it works, as "us" vs. "them" becomes "we" united in a common purpose—to deliver programs that meet military requirements at prices that represent good value to the taxpayer.

International Cooperation

Effective and efficient program delivery is a universal challenge. While we were working on our problems in the United States, our counterparts in other countries were experiencing similar problems. As we convened to discuss issues, we quickly valued our new relationships because we learned from one another.

For example, Sweden contributed to our understanding by describing how earned value was being used on the Gripen Fighter Program. We learned that the technique could be applied effectively, in ways very different from our experience. I'm sure our many years of experience with earned value in the United States, also provided Sweden with valuable "lessons learned." By joining together in a collegial atmosphere, there is little doubt we have all contributed to improving the management process to our mutual benefit by incorporating best practices from many sources.

The Role of Systems Engineering

I have mentioned risk management several times in my remarks, and would like to expand on that for just a moment. I believe firmly that even in their most optimistic application, acquisition reforms will not eliminate risk or negate the need to manage risk at an acceptable level. We need to return to the basics of systems engineering and we need to recognize that risk management is fundamentally a program management activity.

I think we also need to reinforce the idea that good program management principles are universal in their application. We sometimes hear that defense and civilian programs are too different to manage using the same techniques. Within the Department of Defense, we hear things like "ships are different," "you can't manage satellites like you manage airplanes," or "my program is too unique" to be managed like a "typical" program. It's simply hard to accept the idea that there isn't a set of sound ideas and practices that are applicable to managing any conceivable program.

Another argument often made is that software can't be managed like hardware, or that weapon system software can't be managed like business system software. We manage it all in the defense sector, and I expect in the software area we share much common ground with our counterparts around the world.

While the history of defense acquisition includes plenty of examples of projects over budget, over schedule, and under performance, software has proved a particularly difficult challenge. In the past, we selected the best suppliers we could find ... and hoped they would perform. We imposed layers of prescriptive requirements on top of industry practices, and used the requirements to develop, test and support

embedded computers and software, tailored to ship classes, aircraft models, or warfare areas. The resulting products were, and are, costly to support, update and maintain. Acquisition reform has lessened some of the contributors to this legacy, but we must also apply the discipline of good systems engineering to confront the problem fully ... and this includes risk management.

Our chronic underestimation of costs and schedules for software development, coupled with unsuccessful attempts to use software to fix other system shortfalls late in the system development process, leads me to question whether we understand the relationship of software and systems engineering. Today's systems are highly integrated, making it increasingly difficult to draw an imaginary line between hardware and software. Increasing demands are being placed on the human-machine interface. More and more system processes are automated. The systems must be managed in their totality, and that includes managing risk. It bears repeating: The principles of management are largely the same whether you are talking about hardware or software, and risk management should be a discipline applied to the total system.

Some would argue that risk must be completely avoided. Others believe that risk cannot be avoided, so we should accept it as part of the price of any complex program and solve the problems as they come up. I suggest the answer lies between the two extremes. The best use of scarce resources in any program requires that we identify risks, determine an acceptable level for each, and establish those levels as the objectives for managing the risks. Once you accept that managing risk is inherently a program management function, then earned value management can become an extremely valuable and synergistic component of your risk management strategy.

Industry's Response

Now, let me turn to a discussion of how our defense industry partners are responding to the changes in the way we are doing business while undergoing significant changes of their own— very large consolidations from many companies to a few larger, more efficient companies. Change on such a large scale brings risk—risk due to reduced competition and potentially less technical innovation. But risk is always accompanied by opportunity, in this case an opportunity to improve management throughout the new enterprises. The new companies are reengineering their processes to incorporate world-class, best management practices, and we are meeting them halfway.

We see a familiar pattern in the companies that conduct business with us in the United States. Managers first learn about earned value on defense contracts, then use it on other product lines. In time, corporate managers recognize that these programs are managed better than other programs—a lesson learned too often

because a program is in deep trouble—and decide to implement the technique throughout the enterprise on all types of contracts.

Our largest companies, including Boeing Information, Space and Defense Systems Group, Lockheed Martin, and Raytheon Systems Company, are all moving toward enterprise-wide management using earned value. I mention those three specifically because they comprise some 25 companies that existed just ten years ago. We cooperate with our contractors to identify and remove any unnecessary differences between management practices in the public and private sector. Together, we have shown that there are in fact no significant differences and that good internal management practices can also meet the highest standards required for stewardship of public resources.

Our stewardship is of course subject to review. Last year at the first Stockholm conference, the United States General Accounting Office presented its 1997 report on earned value improvements in the Department of Defense. The auditors found that earned value is neither a commercial practice nor a government practice. It is simply a best practice. And at the recent London conference, the British National Audit Office supported the adoption of earned value by UK as an enabler for improving management in the public sector. These independent opinions give us confidence that we are on the right track.

However, the best indicator of progress is industry's growing acceptance of responsibility for these management principles. Work is proceeding on several fronts. For example, British Standard 6079, "Guide to Project Management," was issued in 1996. Just last month, the American National Standards Institute approved Electronic Industries Alliance Standard EIA-748, "Earned Value Management Systems." Both standards are intended to improve industrial management, and both represent large, influential industry groups. As a result, the Project Management Institute has begun an international standards discussion group as a way to encourage coordination among all project management standards and to explore the possibility of an international standard for integrated program and project management.

I believe it is very important that government take part in the discussions about standards. Our role is not to write the standards, but to share our experiences, to learn, and to revise public policy accordingly. While government program managers must understand how earned value will contribute to the planning and execution of their programs, contractors are the real owners of the process. The biggest factor in successfully reforming earned value has been to return it to its rightful owners.

The Revolution in Business Affairs

Despite all the progress we have made through acquisition reform, much remains to be done. Faced with no growth in our defense budgets, we must look everywhere

for savings in order to meet our modernization goals. In other words, we have little choice but to do our jobs better, faster and cheaper. The Under Secretary of Defense for Acquisition and Technology has articulated five priorities for a revolution in business affairs—a further transformation in what we buy and how we buy it. I will describe each very briefly-

First—aggressive expansion and implementation of acquisition reform initiatives. We must continue our work to fully employ our successful reforms at all levels and to achieve broad acceptance and reliance on reform.

Second—increased civil and military industrial base integration. We are seeking an expanded partnership with our prospering commercial industry to create technically advanced products and processes with common applications. For example, through flexible manufacturing, which allows production of defense-unique items on the same lines with high-volume commercial items, we anticipate significant recurring cost savings.

Third—reduced infrastructure and support costs. We need to close more bases and to compete all work that is not inherently government work.

Fourth—a reengineered defense logistics system. Access to advanced information systems and rapid transportation is a cornerstone of this initiative. Emphasis is also being placed on greatly expanded purchases of common-use, commercially available items and reform of inventory management systems and practices.

Fifth—enhanced training and education for the acquisition workforce. To meet the demands of the revolution in business affairs, we must improve learning opportunities in order to equip our people with the knowledge and skills they need to succeed.

These five priorities will influence our near term activity throughout the Department of Defense. But, I can assure you they will not diminish our emphasis on earned value as an enduring set of principles for good program management. Some of our biggest challenges will arise not in new programs, where change is expected and is relatively easy, but in legacy programs—those that have been in the inventory for many years and have well-developed ways of doing business. You will hear from one of those older programs, the F-14 Tomcat, later in this conference. It's an excellent example of what teams can do when they are empowered.

Summary

I would like to leave you with a few thoughts to summarize and conclude my remarks.

First, the world is changing rapidly. By accepting change, we find opportunities to improve both government and industry management practices. Seizing the opportunities requires that we have the ability to manage the uncertainty or risks associated with that change. What we absolutely should not do, is to suppress the change and miss the opportunities that always accompany the risks.

Second, reform initiatives can improve our ability to manage the risks, if we are motivated and equipped to use properly the tools available to us. The best management tools, such as earned value management, cannot achieve the desired results unless they are placed in the hands of people who know how to use them and accept responsibility for their application.

Third, those of you who are new to the use of earned value should benefit from those who have been down the path before. Defense and non-defense programs are more alike than they are different when it comes to applying sound management practices. The same can be said for hardware and software.

And finally, the growing international cooperation among government, industry and professional associations helps us individually and collectively as we move toward coordinated national management standards and possibly an international standard.

Let me close by thanking you for inviting me to join you today. Conferences like this one provide opportunities for us to learn from one another, and to advance our common interests. I wish you a successful and productive two days. Thank you.